MEL Status

Technology Update and Exchange Meeting

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TOPICS

- Master Environmental Library (MEL) Today
- FY03 Activities/Accomplishments
  - Access Site move
  - Linux Port
  - Metadata development
  - PKI development
  - Operational MEL
  - New and planned resource sites
  - Transition
- FY04 Proposed

Delivering the Natural Environment to the Warfighter

Implementing the INEARP will:

> ## *Provide the Warfighter integrated authoritative representations of the natural environment to support multiple user applications*

Using several basic components:

- **Standard Representation & Interchange it**   **Know how to specify it**
  - **SEDRIS**

- **Library Services**   **Know how to find it**
  - **Master Environmental Library**

- **Production Composition & Generation**   **When it doesn't exist**
 - **Environment Scenario Generator**

Key Features of Architecture

- Data stays at resource sites under <u>local control</u>. Resource site maintains standard metadata.
- MEL provides <u>single point of access</u> to distributed geospatial data.
- MEL provides access to data from <u>all environmental domains</u>.
- Development Kit provided so user can develop applications to access MEL directly. (Example: Environmental Scenario Generator)
- Metadata consistent with <u>Federal guidelines</u>.
- Data transfer through <u>standard formats</u>.
  - Gridded Binary format, Binary Universal Form for the Representation of meteorological data, Vector Product Format, SEDRIS, etc.

ACKNOWLEDGES INDEPENDENCE OF DATA SOURCES WHILE PROMOTING INTEROPERABILIT

MEL Resource Sites (1)
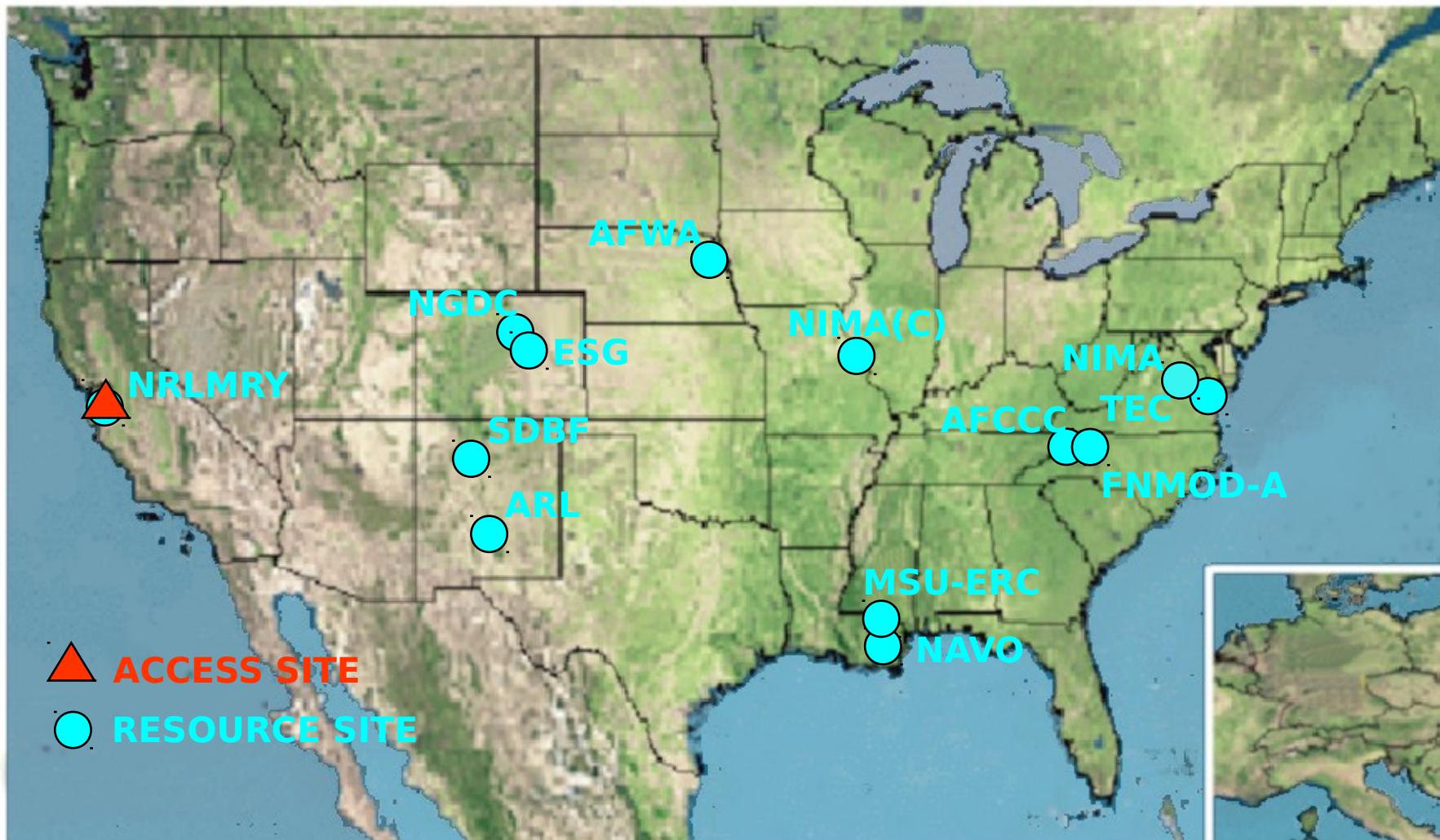
MEL Resource Sites (2)

- Air Force Combat Climatology Center (AFCCC)
  - Atmospheric climatology; historical observations, PIREPS, satellite profiles, etc
- Air Force Weather Agency (AFWA)
  - PIREPS, atmospheric observations, drifting buoy weather observations
- Environmental Scenario Generator
  - NCAR reanalysis, ESG created data sets
- Fleet Numerical Meteorological and Oceanographic Center Detachment Ashville (FNMOC – D)
  - Northern hemisphere cyclone track, upper air climatology
- Mississippi State University (MSU)
  - Atmospheric and Oceanographic model output, Bathymetry
- National Geographic Data Center
  - Near Earth space observations

(3)

- National Imagery and Mapping Agency (NIMA)
  - Terrain; Internet and SIPRNET
- Naval Oceanographic Office (NAVO)
  - Atmospheric and Ocean model output, Bathymetry
- Naval Research Laboratory Monterey (NRL MRY)
  - Atmospheric and Ocean model outputs
- Simulation Database Facility (SDBF)
  - M&S Databases
- U.S. Army Topographic Engineering Center (TEC)
  - Terrain and simulation databases including TSGA technologies and data bases
- U.S. Army Atmospheric Research Laboratory (ARL)
  - Atmospheric, Smoke, Illumination

Access Site Move

- MEL Unclassified and SIPRNET Sites successfully moved to NRL MMD

- All resource sites up except for NGDC and Unclassified NIMA
  – Both have new hardware issues not related to move
  – NIMA attempting to get site up.

- Added new capabilities
  – Web indexing and search software
  – Web log analyzer
  – New scripts for monitoring, and restarting as required, the MEL web page server and servlet engine, and to rotate the server logs

Access Site Move (Cont.)

- Had to configure the new Linux systems and reconfigure an old system
  - Impacted development as old development machine was used for the SIPRNET Access Site to speed up SIPRNET approval. New development system had to be configured.
- Move of sites required more effort than planned
  - Unforeseen issues related to new OS and location of the MEL machine inside a DMZ.
  - Found several small issues related to installation and metadata that have been resolved
  - Only one of the original developers still involved
  - Also, identified existing problems at resource sites and assisted the resource sites with resolving them

Linux Port

- Successfully installed Red Hat Linux Advanced Server 2.1
- Linux Advanced Server required for PKI support
  - Is COE certified and likely to be NSTISSP (National Security Telecommunications and Information Systems Security Policy) certified.
  - Currently, Red Hat has not released any plans to certify the non-enterprise Red Hat Linux 9.x
- More stable operating system than Linux
- Fewer releases and longer support for given release

Metadata Development

- Incorporating ESG metadata approach
  - Use an XML based metadata schema
  - Allows for more flexibility in supporting various metadata standards (FDGC, ISO 19115, etc)
  - Issues related to integrating with existing code base
- Testing updated query interface
- Development work had to be suspended during Access Site move
  - Had to wait until new development machine was fully configured
- Anticipated completion by end of September

PKI Development

- PKI Requirements and PKI Implementation Plan reports

- Server Certificate and HTTPS/SSL successfully installed
  - When MEL web site accessed, server automatically presents server certificate that client browser can accept permanently or for the session. Server certificate details can be reviewed by client user.
  - MEL HTML pages and CGI scripts have been successfully tested using SSL. (Note when this was previously attempted on the SGI/IRIX at the MSIAC, the software required to support the server certificate was installed but the query and order mechanisms did not work.)

PKI Development (Cont.)

- Client authentication
  - Apache web server automatically requests client identity certificate from browser and validates the client certificate .
  - Two approaches for determining if certificate has been revoked
    - Real time query to certificate authorities
      - Did not use, as the sites are down frequently and we did not what to limit user access.
    - Down load Certificate Revocation List (CRL) from certificate authorities – used this approach
      - Keep a copy of the CRL locally
      - Can access the CRL if certificate authority is down

PKI Development (Cont.)

– Implemented Certificate Revocation List (CRL) processing from various certificate authorities

- The CRL will be used to verify that the user's identity certificate has not been revoked
- Developed scripts to retrieve the CRL for both the DoD and the Interim External Certificate Authority (IECA) certificate authorities
- Working with PKI help desk on the DST IECA, as this certificate authority does not have the CRL located at the standard location within their LDAP database.
- Began working with the PKE Help Desk to acquire test valid, revoked, and expired client certificates, along with a test CRL

PKI Development Continued

- Started on client authentication
  - Developed script to extract required information from the client's certificate.
  - Extracted information will be placed in the client's user profile maintained by MEL
  - Information will be used in the authorization process

Operational MEL

- Provided support to operational MEL users
- Maintained/updated the operational MEL content
- Maintained the MEL Access site software and software supporting the operational MEL
- Implemented NRL MMD security and web server requirements
- Developed new installation package for MRSS
  - One install file
  - Includes sample data, metadata, and extractors

New and Planned Sites

- TEC has stood up an Alternative Access Site on the SIPRNET
- ARL is planning a SIPRNET Site
- SVDR initial Alternative Access Site should be stood up soon.
  - Reviewed initial metadata record and provided feed back
  - Creating new MEL Thesaurus for 3D-Models to support SVDR
  - Waiting for SVDR to settle on final configuration before activating.
  - Will expand number of metadata records as SVRD evolves

New and Planned Sites

- OneSAF Resource Site
  - A OneSAF Alternative Access Site is planned to be stood up about the same time.
  - Predicated on SVDR funding
  - Would eventually use the MEL Resource Site Software (MRSS)

Transition

- Transition Operational MEL to permanent site in FY04
- Draft transition plan under review
- Candidate Sites
  - AFCCC
  - Joint Forces Command
  - Defense Threat Reduction Agency (DTRA)
  - DISA
  - RDECOM

FY04 Proposed

- Expand PKI support (finer granularity, encrypted ftp, etc)
- Continue to improve MEL software
- Work with DMSO to locate a permanent site for MEL Access Site
- Transition MEL Access Site and support to the permanent site

Summary

- Unanticipated requirement to relocate the MEL Access Site to NRL MRY has forced real time adjustments to the FY03 program
  - Resulted in the rescheduling and restructuring of several tasks
  - Some efforts will go into FY04, (i.e. transition to a permanent site)
- In spite of this, MEL has made good progress in its FY03 development effort.
  - Majority of tasks will be complete by the end of this year's effort